

MANAGEMENT SCIENCES SEMINAR SERIES

Disruption Risk Mitigation in Supply Chains: The Risk Exposure Index Revisited

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Abstract

Simchi-Levi et al. proposed a novel approach using the Time-To-Recover (TTR) notion to analyze the Risk Exposure Index (REI) of supply chains under disruption. However, this approach assumed that at most one node in the supply chain can be disrupted. In this paper, we proposed a new method to integrate probabilistic assessment of disruption risks into the REI approach, and measure supply chain resiliency by analyzing the Worst-case CVaR (WCVaR) of total lost sales under disruptions. We show that the optimal strategic inventory positioning strategy in this model can be fully characterized by a conic program. Moreover, the optimal primal and dual solutions to the conic program can be used to shed light on comparative statics in the supply chain risk mitigation problem. This information can help supply chain risk managers focus their mitigation efforts on suppliers and/or installations that will have greater impact on the performance of the supply chain when disrupted.

Zhenzhen Yan's Bio

Zhenzhen Yan is a fourth-year PhD student in the Department of Decision Sciences at the National University of Singapore, under the supervision of Prof. Teo Chung Piaw, and she is currently visiting Prof. David Semchi-Levi at MIT. Her research interests include Optimization under Uncertainty with different levels of data availability and with applications in supply chain management, healthcare and pricing problems. She holds Bachelor's and Master's degrees in management science and engineering.